GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

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STRAY STRAWS FROM DR C. C. MILLER

COTTON WASTE that you find along the railroad track is sometimes too rich in grease, and puts out the fire. Mix with it some plain cotton rags, and it will be all right.

IN *Le Progres Apicole* is given as an outfit *indispensable* for a beginner, movable-frame hive completely furnished with foundation, veil, smoker, brush, and uncapping-knife.

THAT G. S. CREGO, who stands up for Maywood as a temperance town, p. 664, may be pretty safely counted on as all right, for to my certain knowledge he raises some of the finest roses I ever saw.

A. I. ROOT has discovered afresh that, the more one lives outdoors, the healthier one will be. He's making progress. Time was when he would smoke bees into the hive when they insisted on hanging on the outside.

ONE POUND of wax to 28 pounds of honey is about the right thing to set down for section honey, isn't it? That's according to Prof. Gillette's figures for comb 1.37 inches thick, which is the thickness in sections 1⅞ wide, with separators.

FORMERLY I thought that a colony that did not swarm stored more than others simply because of not swarming. I am gradually settling into the belief that, when you find a colony not given to swarming, you find unusually good harvesters, and *vice versa*.

HURRAH for Hyde's squirt-gun feeder! Be sure to tell us how it works at Medina. [I should like to tell you, but I can't. I have been away from home, and just returned; but before another issue I hope we shall have some definite practical knowledge of it.—ED.]

HERR THEODOR WEIPPL, who for ten years has so ably edited the excellent German bee-journal, *Bienen-Vater*, has resigned his position, leaving the editorship temporarily in the hands of the committee, with Herr Josef Schmuck as responsible editor.

OUTDOORS *is* a great place, friend A. I. Root. And if we only had the time to appreciate it, we needn't go 'way up into Canada to find it. I can go right out on our back porch and enjoy a more comfortable place than any I found at Saratoga, and just as much outdoors to the acre as anywhere in Canada.

YOUR HEAD'S LEVEL on the prize business, Bro. A. I. Root. I wish all Sunday-school workers could read page 658. Prof. H. M. Hamill, the world's leader in Sunday-school normal work, says: "Do not give prizes, which put wrong motives before the few who win them, and discourage the many who fail."

HIGH PRAISE is given to dwarf Essex rape as a forage plant, p. 666. Now can any one tell us about its value as a honey-plant? In Europe, rape is a very important honey-plant; and bee-keepers haul their bees to the rape fields sometimes, to get the benefit of the nectar. Is rape of special value for bees in this country? and is the dwarf Essex as good as any other for honey?

UNCLE LISHA, what's the use of stirring up our sympathy for Tim Fasset's sobbing boy with his failure to spell *dough* correctly? There's no help for it. During the next three months rivers—well, hogsheads at least—of tears will be shed over our barbarous spelling, by that boy and his kind, just because Stenog and some others with sense enough on other subjects are clean daft on spelling.

AN AUSTRIAN, Ignace Kirchweger, has patented an apparatus which introduces a queen mechanically. Two cylindrical cages have openings which do not coincide until the one with the queen has made a complete revolution in 12 to 24 hours, run by clockwork. [The present Benton cage is about as nearly automatic as any thing can be. Why anybody should want to get up a complicated cage, run by clockwork, I can not see. See editorials. —ED.]

SULPHUR is "the only practical known remedy" for wax-worms, says Doolittle, p. 653. How about bisu'phide of carbon? Another thing: If you find flour like places on your comb honey, the next thing is to sulphur it, and one sulphuring will suffice if no fresh

honey is brought into the room. Will the sulphur kill the eggs not yet hatched? [We have an article on this question of freeing comb honey from worms, in this issue. It has special reference to the use of bisulphide of carbon.—ED.]

"ARE YOU SURE that, by getting the section enough shorter to make it square, the bees will make a better fastening at the bottom?" quoth ye editor, p. 645. Pretty sure, Mr. Editor, if no bottom starter is used. But understand, I give that only as the argument of the others. My own reply would be, "But I don't need to change the shape of the section to get the comb fastened to the bottom-bar. A bottom starter does that best in any case."

A GRACEFUL THING was done by Canadian bee-keepers at their last convention in conferring upon J. B. Hall the distinction of being the only life-member of their association, on the ground that "he has been the life and soul of the association meetings for the last nineteen years." Although Mr. Hall does not write for the papers (more's the pity) he is a walking cyclopedia of bee-knowledge, and, besides, "he's a mighty good fellow." [Yes, it is too bad we lose the benefit of Mr. Hall's experience through our bee-journals.—ED.]

J. F. MUNDAY, in *The Australasian Bee-keeper*, wants me with closed eyes to taste a sample of a greasy section and compare it with one snow-white. He thinks I would pronounce the first the better honey. That's not the question, friend Munday. It's not what *I* prefer, but what the dear public prefers; and so long as said public insists on the whitest sections, and the greasy sections must sell at a lower price, I don't want to produce greasy sections. [Some greasy honey would taste no better (if as good) than some good white-faced honey. If I had to buy the honey for my own use, without tasting it, I think I would take the white. Some comb honey is greasy, for no other reason than that it is old last year's goods.—ED.]

WHEN A QUEEN is sent by mail she always has an escort taken from her own hive, doesn't she? The other day I put into a shipping-cage a queen I didn't value, and put with her some bees from another hive. They were entirely kind to the queen. Probably they are so frightened at being shut in that they have no thought of fighting any thing. If it always works that way, why can not that be made the basis of a safe method of introduction? Instead of caging the queen for safe introduction, cage the bees. [I know, it is true, that a few bees when caged will accept a queen a good deal better than when they have the liberty of the hive. Their close confinement and close quarters so disconcert them that they are willing to accept any thing; but I know from experience it is not safe to put strange bees into a cage with a good queen, although it *can* often be done without any bad results. —ED.]

Heavy rains still pouring down,
Followed soon by broiling heat;
Vegetation's rank and green—
Food for all to eat.

AMERICAN BEE JOURNAL.

O. O. Poppleton, of Florida, reports 16,500 lbs. of extracted honey from 115 colonies.

Mr. S. B. Strater, of Illinois, suffered the total loss of his shop and gristmill, last July, including books and every thing in the mill.

D. L. Durham, of Illinois, says that sweet clover and heartsease are the salt that saves the bees and bee-interests in his vicinity.

A correspondent says, "I set one sweet clover plant to the right of each hive." I supposed all clover plants were equally sweet. What kind of clover was it?

R. V. Goss, of Alabama, found a dead lizard to which the bees had attached their comb. It probably died in a hollow limb; and as the bees were unable to move it, and it being perfectly dry, they built right up against it as they did inside of Samson's lion.

Mr. York prints a map of a part of Chicago showing how to get to the convention and to his office. By the way, how that town grows! Since 1890 it has added a whole Cleveland and a Detroit to its population. I'm glad Lake Michigan prevents its growth toward Medina.

When Mr. Langstroth told Prof. Cook that he wanted to find some one to revise his work on bees, Mr. Cook suggested the Dadants, and he still thinks nobody is sorry for the decision. Of the A B C book he says it is a work of which all may feel proud. Of Cowan's book he says he does not wonder that it is regarded as the most authoritative work in Europe.

BRITISH BEE JOURNAL.

Mr. Buttel-Repen, of Germany, has written a book on the life history of the bee, and in it he puts forth the theory that bees have seven kinds of smell, as follows: Distinctive individual smell; distinctive collective smell; brood and food smell; drone smell; wax smell; honey smell; nest smell. The author says, "I am of the opinion, which is shared by many scientists, that insects possess senses or sensation quite unknown to us, and which on that account we can not even imagine; so that we are unable to say whether the impressions produced on us by certain actions and movements have the same effect on insects. For myself, I am firmly persuaded that they are not." While it is agreed that bees have

no visible hearing organs, they certainly have something that serves that purpose, and the same may be said of the smell.

Mr. A. C. Sewell, writing from South Africa, gives the following interesting items in regard to the fate of the poor bees that happened to be between the two contending forces:

An apiary near Spion Kop, consisting of seven bar-frame hives, is cleared out, but in this case some broken frames scattered about gave the impression that they had been "taken up" on the Boer system by thrusting some lighted grass into the entrance; the owner also losing a good supply of bee-appliances, as well as all his household goods and farm implements.

The tragic fate of another stock in a fine, full-size glass observatory hive, standing in a garden inside the town, was not involved in the mystery attaching to the others, for it was blown to atoms by a shell that burst close to it, and a splinter from it knocked a cup of tea out of the owner's hand, who himself escaped uninjured.

A little lot of bees up near the top of the mountains managed to escape the general ruin, and beyond one or two isolated hives that I have not yet heard about, I think it is almost all that is left in the district. But the owners do not intend to give up bee-keeping, as one was down here last week and took back two stocks to make a fresh start, and I have just heard from my old friend that he has captured a stray swarm, evidently a starvation one, and is bringing it up with the syrup-bottle.

For disinfecting hives, the editor has the following sensible suggestions to make:

There can be no more effective means of thoroughly disinfecting hives—in which bees have died through foul brood—than a "painter's lamp." No organism can stand contact with fire, and the lamp referred to intensifies heat just as a blow-pipe does the flame of a gas-jet. Remove the paint from hives inside with a spatula—as painters do very quickly—and then with the flame "scorch" the surface of the wood without burning. Even the spores of foul brood would go down before *that;* moreover, it does away with the need for repainting.

As indicating the great tenacity with which foul brood holds on when once well under way, I copy the following from a correspondent in Wickford, England:

I had my first experience of it in the spring of 1899, three of my hives being attacked. In two of them the brood was in the brown or ropy stage, while in the other one it was in the light-colored or early stage of development, which does not smell so bad. I burned the worst of the three outright, and when our county expert came he advised driving the other two stocks and treating the bees as a swarm, which I did, uniting both lots in one hive on six frames. I then fed the bees till they would take no more. They built out and filled twelve frames of comb, and I packed them for winter on ten frames The bees came through all right and were doing well when the expert came this year. I put on a box of shallow frames in good time; but as the bees did not start work in them I took them off last week, and on examining the comb below found the disease there again, but not bad, while there was a good strong lot of bees. I soon made up my mind what to do this time. I have burned and buried the lot except the clean shallow combs, which are put away ready for melting when I send my wax for this year, and I hope that will end it with me. My other eight stocks are doing well. I may say the hive is broken up for firewood.

The International Apicultural Congress will be held in Paris on the 10th, 11th, and 12th of September. Invitations have just been received here, requesting the members of the Root Co. to be present. Mr. Calvert intended to attend when he left here. Such a meeting can not fail to do much good.

DEVELOPING CLOVERS WITH SHORTER COROLLA-TUBES.

The Method to be Followed, and Some of the Difficulties, from the Standpoint of One who has Spent Years in Working at the Problem.

BY E. E. HASTY.

Friend E. R. Root:—You call me out on the clover-developing proposition. Yes, I was in that effort quite a long time—grew cold at length, and let the multiplicity of other things cause me to drop out. Perhaps the indifference of the bee public helped me a little in getting cold; and if Dr. Miller's call for renewed effort gets lots of volunteers I may wake up and "tag on."

And what can I tell to the new volunteers which will be to their profit? Perhaps not very much. I'll advise them to keep distinct in their minds the three kinds of work to be done. Call them, if you please, A work and B work and C work. The A of it is to go into the fields and select short-tubed clovers. Better take plenty of time and do lots of this, as this is likely to be the most encouraging part of it (perhaps all the encouragement you'll get). Field clovers vary greatly—vary in the line of being lots of long-tubed ones and lots of short-tubed ones, and also vary in the line of there being few and rare specimens, which can be found by long hunting, much more hopeful than the easy-found ones.

Work B is the slow and tedious work of raising seedlings year after year, and *keeping them from backsliding*, as they will probably disgust you by doing, and slowly, with careful selection, getting a little shorter and shorter as the years go by. It was this work that tired me out. It is going to take a great many years. Five years, or ten, will be only a "circumstance" in it. Still, perhaps it's best not to give it up, even if like

> Freedom's battle, once begun,
> Bequeathed from bleeding sire to son.

It is necessary to keep in mind the fact that the time of year, amount of fertility in the soil, vigor of growth, drouth or the opposite, and various other things considerably affect the tube-lengths of the same plant. On these accounts we often seem to be gaining when we are not. And it *might be* that we would seem to be losing when we were really gaining. Practically, after three or four years of effort you will *probably* feel very much befogged as to whether you have really gained any thing or not.

Work C is a sort of diamond-hunting work. Most plants, besides their capacity for gradual change, show from time to time sudden and great changes in a particular seedling or a particular bud. These almost startling manifestations are called "sports." If the desired bee-clover arrives during the present genera-

tion it will be by finding and rendering permanent one of these sports. During the years I was in the work I found two sports, or plants, which I called such. One of them I lost my grip of so completely that I have nothing to show for it—couldn't be *sure* that it would ever have filled the bill any way. The other one seemed to be pretty much all one could ask, gained at one leap—but with one lamentable shortcoming. It was about as near to being *seedless* as a plant could be without being absolutely so. I never had a dozen seeds at one time. To have even one plant in bloom, when a friend called and I wanted to show him my prize—why, I considered myself lucky. A package in my clover-drawer says on the outside, "Three seeds, 1897;" alas! too old to grow now, I fear—and that is all I have to show for years of effort with that incipient variety. Since the first few years, the most hope of success which I have been able to cherish has been that, with long patience, a plant might appear in this succession which would have flowers as open to the bee as the parent flowers have been, and *also* seeds like those a civilized clover ought to have. Perhaps when the weather gets a little cooler I'll try those three seeds for all they are worth.

There is also a sport which *frequently* appears in red clover, having white seeds and pure-white blossoms. I made easy progress in breeding this down to a fixed variety; but had I kept on to completion it would have been of the same use as stripes around our bees' tails, no use at all—tubes no shorter than ordinary reds

But in fussing with the white sports I think I made a *discovery* which perhaps ought to be understood and considered by all those who work in such work as this. It is, that progress tends not to go on regularly with each generation, but by regular *alternation* of generations. A little hard to describe this so a reader will catch on readily. Say you are trying to get a white variety from a white sport. First generation you raise 100 seedlings, and say 3 of them are white and 97 backslidden and red. (Think you have got a tough job before you.) Second generation, 100 seedlings pan out 50 white and only 50 backsliders. (Think you are getting on swimmingly.) Third generation you find 15 white to 85 backsliders. (Half inclined to give the thing up as impossible.) Fourth generation, however, pans out 55 white to 45 reds. And so it goes on, with regular oscillation back and forth with each generation, but on the whole manifestly getting ahead. I have come to feel that something like this affects nearly all work of the kind with seedlings.

Richards, O.

[While your experience, friend Hasty, is somewhat discouraging, yet it goes to show that, if the effort is persistently followed, we shall be able to accomplish something. If the example given in your last paragraph represents somewhere near the actual results you secured, then, in spite of the backsliding, you got in the fourth generation over 50 per cent of the very kind of clovers you were seeking.

I have known something about this backsliding of varieties; but I did not suppose the tendency to go back to the original was so strong. If the same rule holds true in the breeding of cattle, of horses, of poultry, then we have great cause for encouragement, because, in all the lines of stock mentioned, in spite of the difficulties a very great differentiation has been secured. The running horse is very different from the trotter in general build; and both differ very greatly from the draft horse. The variety of specimens in poultry goes to show the possibilities in working from sports. Now, then, my point is this: If the breeders of all these various kinds of stock have been beset by this constant backsliding to the styles and markings of the original parentage, and *they* have been able to secure what they were after, *we* can do the same. The only difficulty is, can bee-keepers interest experiment stations to such an extent that they will keep up a line of work that will cover a period of years? From what you say, I should judge that such a line of experimenting would have to go from one generation of experimenters to another before the goal could be reached.

I should be glad to receive an article from some one who knows something of the difficulties of breeding poultry stock to weight, color, and markings, and just how these things have been secured. Such an article will give us pointers in breeding bees with longer tongues and clovers with shorter corolla-tubes.—ED.]

FUMIGATING COMBS AND SECTIONS.

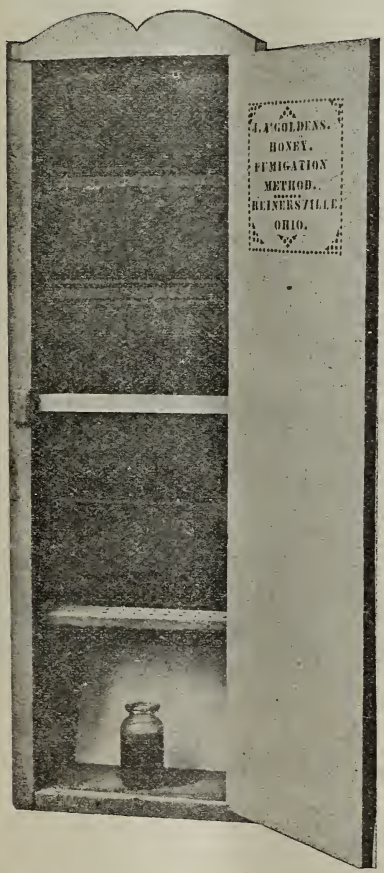
How to Make a Fumigating-box; the Use of Carbon Bisulphide.

BY J. A. GOLDEN.

The question how to destroy the moth-worm, both in brood-combs and in section honey, is of long standing, and many pages have been written setting forth the various methods employed, giving the formulas for the benefit of bee-keepers at large, as well as consumers of section comb honey; and while the various methods have proven successful with many bee-keepers, there are still many who have been unsuccessful with any of the plans published, even with the bisulphide of carbon. I am fully convinced that carelessness has been the principal cause of failure to destroy the moth-worm, either in brood-combs or section honey, especially with the fumes of sulphur or bisulphide of carbon, for either, properly used, will effectually destroy every vestige of the moth-worm, large and small—yes, even the eggs secreted within their hidden deposits; but to be successful with any method one must have a properly constructed room or cupboard specially for the purpose of fumigating with either sulphur or bisulphide of carbon. This, properly and carefully attended to, can not fail to prove effectual every time; and why it is that bee-keepers will toil and sweat in the hot sun in producing a beautiful lot of section honey, and then put it through some slipshod

form of fumigation, and put it on the market, or store it away for better prices, and in a short time see it all marred up by the little destroyers, the wax-worms, is a problem that I have never been able to solve.

Just a few days ago I called at a place where I saw a beautiful lot of honey, all nicely filled out in the no-beeway sections; but when I picked a section up and inquired who the producer was, I really become hot. Yes, there it was, all over the face of the honey—the little seams of powdered comb—something I never saw on comb honey properly fumigated either with sulphur or bisulphide of carbon. The latter is preferred by me in preference to any other, as it is a dead shot every time, and easily applied; and for the benefit



of the bee keeping fraternity permit me to give my method, illustrated by a cut of my fumigator, which now contains 48 combs of honey. This honey is taken from colonies that have swarmed. When making the change, on the fifth day after returning the swarm, as per my method, it is fumigated, and will be stored away in my honey-room for spring feeding.

Having used bisulphide of carbon I will guarantee that not a living worm or egg remains within or about the 48 combs you observe hanging in the fumigator. Thus by looking at the cut any one can construct a fumigator for a few cents. This one is 6 feet and 4 inches high, 20¾ inches wide, and 15 inches deep, inside measure, made from plowed and grooved lumber, and as nearly air-tight as possible. Cleats upon which the frames rest are 1¼ in. square lumber, and thoroughly nailed in place. The cleats upon the side, on which the door hangs, project out past the binding, so that, when placing a frame in at opposite sides, the frame rests on the cleat, and pushes back. Each apartment holds ten brood-frames having six compartments, in which 60 combs can be fumigated at each time, or 363 3⅝×5×1½ sections of comb honey at each fumigation. The cross-strip at the door-button is a tie to keep the cupboard from spreading. The board which you see full of holes rests on side cleats, and is used for section honey to rest on, also for spreading the fumes evenly to the sections A perfect-fitting door with a ⅜ hole at the bottom and top of fumigator, with stoppers, completes one of the most essential pieces of furniture belonging to an apiary.

When placing section honey in my fumigator I use two boards, one placed half way, as there would be too much weight resting on the lower sections if but one was used after placing on three tiers. I have a set of strips of thin lumber, ¼×1, which I place over the top of sections, spaced to rest on sections at corners; then I continue placing sections, leaving a small space between the face of sections; thus a more thorough fumigation is achieved.

To fumigate I place a Mason pint glass jar as shown in cut, and pour in a small portion of bisulphide of carbon, and close the door and remove the stoppers from the top and bottom, leaving it thus for an hour, the little draft forcing the fumes to every section at the same time, when the stoppers are replaced and left for ten hours; then remove the jar containing the bisulphide; close the door and remove the stoppers, and remove your honey at any time, with the assurance that no wax-worms exist about it. Brood-combs require at least 48 hours; and, if badly infested with the moth, pour a small portion of bisulphide in a plate and set it on fire and close the fumigator. Thus the fume is strengthened by the fumes of carbonic acid and monoxide of carbon, which penetrates through the entire mass, and every living germ is destroyed. Only brood-combs are thus treated.

Mr. Davenport, in his valuable article in GLEANINGS, page 564, makes mention of two kinds of bisulphide of carbon. I think there is but one—carbon disulphide or bisulphide (sometimes called), inflammable, with strong characteristic odor and aromatic taste. This is more inflammable than ether, and great care should be observed when using it. It also should be kept in a dark cool place in well-stoppered bottles. So far as bisulphide fumes injuring comb honey, if so I have never been able to discover it, nor have any of my patrons; and if properly used it is safe, effectual, and valuable to apiarists, and a blessing.

Reinersville, O., July 25.

HIVING SWARMS IN SHALLOW BROOD-CHAMBERS.

Hives for Producing Comb Honey; Keeping Down Increase; Dispensing with Movable Frames.

BY HARRY LATHROP.

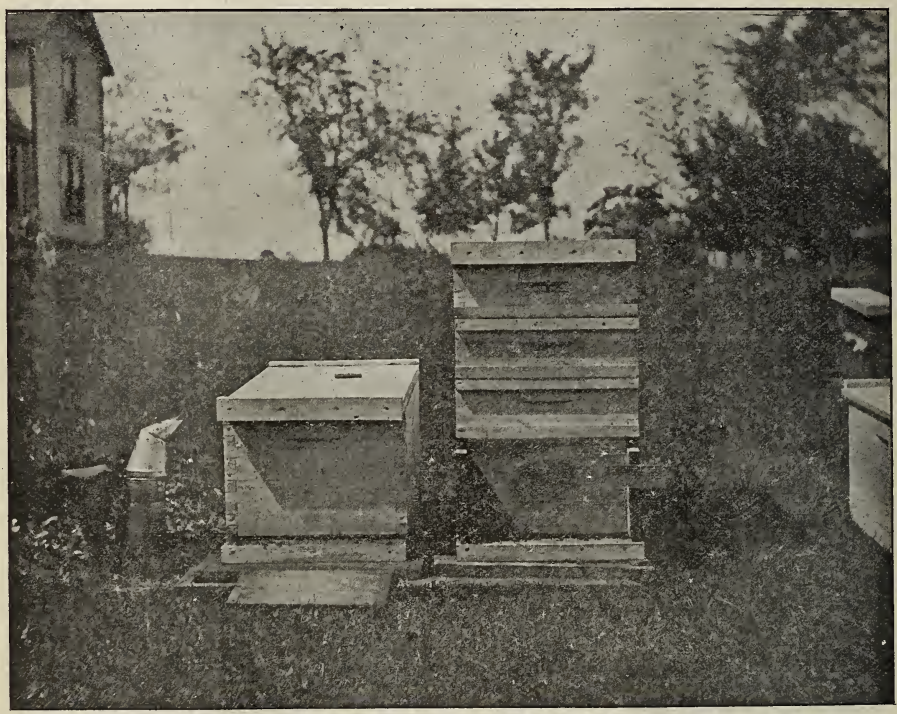
Friend Ernest:—In response to your request I send you herewith some views taken in my Monroe apiary where I use the eight-frame Dovetailed hive. These views show the hives from which swarms have issued, while the supers are on a shallow brood-chamber in which the swarms were hived on the old stand. As I said to you recently, with our short season of honey-gathering it will not do to hive swarms in ordinary brood-chambers, as it takes too long for the bees to get things filled up in shape below. I do not like side contraction, because we want bees and brood under all the sections. Furthermore, when a bee-keeper has as many colonies as he wants on his field he must arrange to double back at the close of the working season.

I will explain briefly how I got to working with temporary brood-chambers. I had a lot of old brood-chambers, the same size as the eight-frame Dovetailed, but much deeper. I had them ripped up to make shallow extracting-supers. They are just seven inches deep, the frames enough shallower to allow the usual bee-space on top.

To get these frames filled with comb, I at first began hiving comb-honey swarms on them; but it is so satisfactory that I would make and use them, even if I did no extracting. We fasten a starter of medium brood foundation in each frame, enough to half fill the frame. The bees soon build them clear down, and nearly all worker cells. When I hive in these I usually place a spaced queen-excluding honey-board under the sections, and I do not think it retards the bees any.

I have another arrangement, very similar, which I have used to some extent, and like first rate too. It is a shallow brood-chamber made of common fencing, and having common lath nailed in the top—no frames. The lath are planed smooth, placed only a bee-space apart, and a close bee-space (¼ inch) below the top edge of the brood-chamber. The supers of finished honey come off from these as clean as they were when they went on, even when used without queen-excluders. It is the same with the Dovetailed hives as you make them. There is no trouble from burr or bridge combs, while the Grimm-Langstroth hive is very bad in this respect.

After the honey season is over, these shallow brood-chambers with frames are handy to



H. LATHROP'S MONROE APIARY.

Swarms from Dovetailed hives worked for comb honey in shallow temporary brood-chambers; very little honey stored below in the shallow frames; outside depth of brood-chamb r 7 inches.

use in queen-rearing if such is desired; and, later, the bees can be returned to the hive from which they came, which, of course, will contain a young queen. I use Danzenbaker bottom-boards with these shallow brood-chambers or any flat board with strips nailed on to make a bee-space. The Danzenbaker hive and system is all right; but when a bee-keeper has all the Dovetailed hives he needs, what is the use of buying an expensive hive for comb-honey production when he can make the arrangement I have described for about ten cents each? We have a number of good teachers on comb-honey production. At the head stands Doolittle; but he does not use our hive; his teaching is more general.

A CORNER IN MONROE APIARY.

Comb-honey work, Dovetailed hives, and shallow brood-chambers; the colony with supers on will be united to the colony in Dovetailed hives at the close of the season.

Davenport and Mrs. Barber are specific, and they are all right. Among them all, no man knows better than Danzenbaker how to get comb honey. But we can't all adopt his hive, on account of the expense and work of changing.

But while I have been speaking of the way in which I handle colonies that swarm, I want to say that I have fewer and fewer swarms. When there is a good honey crop I have less than in a year when there is just enough nectar to keep brood-rearing going at a good pace. This year, with a fair crop of white clover, and a basswood flow of only three or four days, I had less than 25 per cent of colonies that cast swarms in the Browntown yard. Where swarming does not occur, the Dovetailed hive or the eight-frame Langstroth is all right for comb honey; but I get no more finished comb honey from those colonies that do not swarm than from those that do; but there is less work involved. I think Mrs. Barber's method of first giving a set of extracting-combs is a splendid practice to prevent swarming. In some cases I give a set of full-depth extracting-combs; and as soon as they are nearly full I take them away and give them to a weaker colony to ripen, and in their place put two supers of sections containing full starters. The bees, being used to the same amount of space above, will occupy both, and finish evenly. Our white-honey harvest is about 75 per cent of a full crop.

Browntown, Wis., July 20.

[I believe that your ideas in the matter of the production of comb honey by the use of shallow brood-chambers, and keeping down increase, are orthodox and sound for some localities. Some ten or twelve years ago this general plan was talked of and advocated much more than now. While the scheme is not new, it is worth bringing up at the present time.

It was Mr. Heddon who, years ago, intimated the possibility of using shallow brood-

chambers without movable frames, on the plan of handling brood-chambers only. In the production of comb honey such a scheme would be possible. I said there are a good many throughout the country who are practicing essentially the same methods you advocate. I should be glad to hear from others who have made the system a success.

With regard to the depth of brood-chamber (7 inches) I would say that Mr. Danzenbaker has on file hundreds of letters indorsing that depth for a brood-nest for the production of comb honey. Strangely enough, he has also testimonials from those who have placed the seven-inch brood-nest and the ten-inch brood-nest side by side, with the result that the taller ones were the only ones that got any surplus comb honey. Mr. Danzenbaker explains it by saying that the ordinary 8 and 10 frame Langstroth size is the wrong shape, and that to contract it by means of division-boards does not give good results—that it should be contracted horizontally. This same idea was advocated years ago by Mr. Heddon, and by those who favored and adopted his system.—ED.]

BELGIAN HARES.

Their Life History; Continued from Last Issue.

BY PROF. A. J. COOK.

The English fanciers recognized at once the excellence of the Belgian hares. Their beauty, grace of form, excellence of flesh, and, best of all, their hardiness and abundant fecundity, each and all recommended them to the intelligence of the English breeders. Such men as Slater, a scientist of no mean rank; Dr. Barham, Mr. Ernest Wilkins, and Secretary W. Lumb, were not only enthusiastic admirers of the new *leporines*, but engaged actively at once in the improvement of the race and the dissemination of knowledge regarding it. As already stated, these English fanciers kept before them, as an ideal, the English hare, *Lepus timidus*. It is even stated that one of the best breeders had one of the English hares stuffed, and kept it before him as an ideal to work toward in perfecting the new race. In this way has been acquired the rich brown rufus-red coloring with its ticking of black, the graceful, clean-cut form of the animal, the perfection of eye, ear, and limb development, and the exceeding vigor and prolificness of this breed of rabbits. I doubt if we can get a better idea of the characteristics of this beautiful animal than by giving the scale of points adopted by the British Belgian-hare Club, to be used in judging the leporines at the various exhibitions. I will comment on each feature as it is given.

Color—rich rufus-red; "not dark smudgy," extending well down the sides and hind quarters, and limiting the white under the jaws to the utmost. 20

Ticking.—The word "ticking" refers to the black color which results from the tipping of the ends of the hair with jet black. This should be wavy and plentiful, but should be confined to the back and loins. If the ticking extends too far, the "golden tan," as the English call the rufus red, does not produce the beautiful contrast that is desired in the best show animals. 15

Form.—Body long, well cut up in flank, ribs prominent, back slightly arched, loins not bunched, but smoothly rounded; head long, chest with good muscular development; tail straight, not corkscrewlike—in all a form suggesting that of a well-bred racer. The very shape should suggest alertness or sprightliness of demeanor. Squatty, lazy animals will stand little chance in the show-ring. 20

Ears.—The ear should be about 5 inches long; thin, with a well-marked lacing. By "lacing" is meant the black color that tips the ears. This should extend as far down on the outside edges as possible. The front of the ear should show the rufus red with ticking, the inside clear rufus red. . . . 10

Eye.—The eyes should be rich brown or hazel in color, full round, bright and honest. 10

Legs and feet.—The fore feet and legs should be long, straight, and graceful, and free from white hairs; in fact, all the legs should be well covered with a uniform coat of rufus red. 10

Weight.—The weight should be about eight pounds. 5

Condition.—Not fat, never bunchy, but flesh firm like that of the race horse. The fur should feel well to the touch. . . 5

Without dewlap. 5

Total— 100

In the above description of the color no mention is made of white. There is a white patch both in front of and behind the eye, and a streak, nearly white, over the front of the upper eyelid; beneath the chin, extending back to the angle of the jaw, and showing in a side view, is also white. The base of the ear on the outside is white, as is a part of the inside when seen in profile. There is no other white except that of the belly and between the fore and hind legs. As we see from the description above, the only black is the tip and margin of the ear and the ticking, which is confined to the back and loins

All of the other parts are of the rich-red chestnut, which, as we have seen, should extend to the tip ends of the feet. To quote from the admirable work of Mr. Ernest Wilkins on the Belgian hare, from which I have received much information: "The whole properties of the make-up of the Belgian should combine to the eye, as the wild hare does, a look of gracefulness and activity. A thick, choppy, angular Belgian is an abomination."

I will next proceed to give the life history of this interesting animal. The males become virile at four months of age, though they do not mature nor reach perfection in form and coloration until eight months old. In some cases this last is not true until the rabbit attains the age of one year or eighteen months. The males are pugnacious, and do not do as well if kept in adjacent pens. The females commence to ovulate at four months, after which they ovulate every four days. From

six to fifteen eggs pass from the ovary at each ovulation, and thus we see that from six to fifteen young may be born at each parturition. The period of gestation, or "kindling," as it is called by the rabbit-fanciers — that is, the time from mating to parturition — is thirty days. As ovulation may take place in four days after birth of young, it will be seen that eight or more litters may be produced in a year. As the number of young ranges from six to fifteen, we readily understand how it is that the animals are so exceptionally prolific. The young rabbits nurse for about six weeks, so that, if the mother is again mated in thirty days from the time of giving birth to her young, she may have a rest period for two weeks before giving birth to another litter. While, as we have said, the males are virile at four months, they should not be used before eight months old, when one good buck will be sufficient for twenty-five does. As the males get older they are apt to become bunchy or choppy, and so some of the best breeders recommend that males be used only between the ages of eight months and two years. I do not believe this is a good rule to follow. If a person has an exceptionally good male I think such male should be used, even though it did become somewhat unshapely. From the general laws of breeding I should suppose that he would still continue to transmit his good points, and would not disappoint his owner. I think no one objects to breeding does from the time he commences, when the doe is eight months old, till they are three or more years of age. If I remember correctly, the prize-winner, Lady Britten, not only took the cup at the Palace two years in succession, but also won the prize among old does the third year.

PRINCE YUKON, OWNED BY S. N. KEMP, LOS ANGELES.

The principles that apply in breeding Belgian hares are the same that hold among other animals. It pays well to begin with good stock. As the male is half the herd it is especially desirable that only good bucks be secured. Though it is not so necessary that all the does be of good quality, yet it is doubtless very wise to start with a fine strain of does. The cost of a single animal, even of the expensive strains, is not so very great but that it will easily be repaid in a very short time by the added value given to each of the very numerous progeny. In such breeding we may well remember the proverb, "Well begun is half done." The prospective breeder should study the animal till he fixes in his mind an exact picture of what he desires to produce. He should then select and mate his animals that he may reach his ideal in the quickest time. While it is always best to breed from excellent stock, there is danger, as in all other breeding, in following too close in-breeding. While this may produce very fine (and in many respects wonderful) results, there is great danger of producing animals with lessened vigor and impaired constitution.

I think there is no question but that the Belgian-hare industry will go well with that of bee-keeping. It is found well to call a halt in breeding during the hot months. Thus, while the apiarist is most occupied there may be a let-up in the care required among the rabbits. Any way, the best proof of the pudding is in the eating, and I know of some bee-keepers who have made rabbit production a very great success, and have used it to tide over the discouraging failures in their apiaries during years of drouth and consequent honey famine. I believe it will pay bee-keepers who wish to add some other pursuit to that already adopted to study up the Belgian-hare industry.

That this business has merit appears in the fact that though hardly more than a dozen years old in America, it has already assumed exceeding proportions. While attracting not a little attention in the East, yet, owing to the more genial climate of Colorado and California, the business has made unparalleled growth in these latter States. I think the first association was organized in Denver, while now there are many associations and clubs in California. That the business has been unduly boomed, there can be very little doubt. Already a reaction seems to have set in, if we may judge by the lessened price paid for this savory meat. Chickens are grown everywhere, and by almost everybody; yet dressed chickens sell in many places for 15 cents per pound. If dressed rabbit meat can be produced, as I have been assured, at 9 or 10 cents per pound, is it not almost certain that rabbit-raising will become a reliable business, and rabbit meat a staple food product in all our markets? I believe we may look forward with considerable confidence to such an outcome. The excellence of the meat, the health and vigor of the animals, the ease with which they can be bred and reared, and their startling fecundity, all would seem to indicate that the business has come to stay. I know very shrewd business men who have put thousands of dollars into it. The fact, too, that a person may commence in a small way at a very slight expense, and grow so quickly into

a large business, also recommends the industry. It is stated by good authority that, with a good buck and five does, a single season may give a rabbitry of 300 animals. I understand, too, that the whole building equipment for this number may not cost more than one dollar per animal, or $300.

Southern California may almost be said to be the paradise for this business, owing to our exceedingly mild climate. The hutches may be very inexpensive, and the breeding season may be continued throughout nearly the entire year. It is also easy here to secure good ventilation with no danger of exposure to cold.

THE VARIATION IN HORSES AS WELL AS BEES.

Just as I was loading supers filled with sections from my shop to take to one of my outyards, about the last of May as nearly as I remember, Deacon Strong came in with a cheerful "Good morning, Uncle Lisha;" but I noticed something was not quite right, and I inquired, "What is the matter, deacon?"

"Oh! nothing much," he answered; and after a few moments he asked, "Did you know my horse Prince is dead?"

"Dead? no! When did he die?"

"A few days ago—or, rather, nights, perhaps I should say, for I found him dead in his stall in the morning. The horsemen think it was colic, or something of that sort. It's quite a loss, but the worst thing was to think that he died there all alone without medical assistance." He talked on, "There are plenty of horses to be had, I find, but there are not many just what one wants. Almost the next day after old Prince died, Antoine Duprey wanted to sell me an old plug he had. Said he, 'A hoss is a hoss; and if it young enough it's all right. She no look very good, but she can go like sixty.' He seemed to think he could make me think what he wanted to, but I declined to buy. A little later Tom Townley called with his chestnut mare. He said there was all the difference in the world in horses. Some were great travelers, and could travel ten miles an hour while another was going five. And then one would work all day and then kick up at night, as though nothing had been done. Some would live on very little, while others seemed to be little better than machines for running through fodder; and he gave me to understand that his chestnut mare would keep fat and sleek on pure air and three quarts of oats a day, although he did not say so exactly. But really I never did realize there was such a variety of horseflesh or such a difference between different animals, and I have been wondering if there is as much difference between bees."

"I have thought about it a good deal myself this spring," I replied, "and have watched more closely than usual, and am more and more satisfied that just as great differences exist among bees as horses. Take the matter of size, for instance. I notice a very perceptible difference. I was so much interested that I brought some home from an out-apiary, and, after keeping them some time, placed the bees from the two hives between two thin glasses, and took them to a photographer to be photographed so that accurate measurements could be taken; but the artist said they were the worst things he ever tried to photo—worse than babies—would not keep still, and so spoiled the plate; but the plate was clear enough so by actual measurement we found a decided difference."

"I wonder," said Deacon Strong, "if these differences in different hives of bees will not account for some of the differences of opinions among bee-keepers."

"I have little doubt of it," I replied. "You remember the difference of opinion between the Roots and Doolittle as to the distance bees will fly for honey, and gather and store successfully. Doolittle seems to think they will fly from three to six miles from choice, while the Roots think that unless the flowers are within two or three miles bees will not make much headway in storing surplus. Now, I have often wondered if this difference was not owing to Doolittle's having stronger bees, or those capable of more rapid flight, although the lay of the country may make some difference."

"I have wished I knew," said the deacon, "what makes the difference in two colonies side by side. So far as one can see, both are equally populous, both have the same amount of brood and honey, and queens of the same age, and equally prolific by the middle of May, and yet in a few weeks one has far outstripped the other; and I don't see but we shall have to lay it to these natural constitutional differences, greater strength, or constitutional swiftness of flight, larger honey-sacs, length of tongue, etc., or all of these combined."

"It is interesting to notice how all the queen-breeders are of late recommending their queens for business rather than for color I believe the tide is setting in in the right direction," I replied.

"Great granthers! talking bees still! I'd supposed you would have talked the subject dry long ago," said neighbor Simpson, who had come to borrow a quarter of a pound of Paris green to finish spraying his potato-patch.

"Good morning, Mr. Fasset. I wonder if the deacon and I can not get together for a little bee-chat but you know instinctively what we are talking about, and come over to hear or help carry on the conversation. At this rate I shall not get away with this load of sections before noon."

"No, that isn't it," said Tim. "But I come to ask a little advice. I want to raise some choice queens this year; in fact, I want to raise enough queens to replace all my old stock."

I noticed he seemed a little excited.

"Dog it all! Consarn it! I have got into —"

UNCLE LISHA'S TWO-DOLLAR 4x6 QUEEN-REARING HOUSE.

"Careful!" said Deacon Strong. "I hope you don't mean to be profane."

"No," said he, "I don't; but I have got into a great scrape this spring. You know I bought a tested queen of ——, and raised a lot of queens from her last year; and those hives with those queens had filled their combs so full of honey from willows and dandelion blossoms that I had to stop right in corn-planting time and take out some of the heaviest combs of honey, and give empty combs so the queens could lay—something I never had to do before. It beats the bangopher how those bees do haul in the honey. I want to raise a lot of those queens this year. Doolittle says you want a warm room in which to transfer the larvæ, and you know my shop is large, and slow to heat, and I thought I would take them into the kitchen; but a bee-sting would almost kill my wife, and I haven't the money to build a small shop right out among my bees. It would cost more than twenty-five dollars."

"Well," said I, smiling, "just you come and see what I have been doing. I was in about your fix, but I have now what suits me very well. In fact, I never had a small thing please me more, and it has cost me less than two dollars besides the labor."

On our way to the bee-yard Fasset asked, "Did you know we have another boy down at our house? We are in luck. He came where he was wanted, and we are all more than pleased."

"Is it likely to prove a 'howling success'?" I inquired.

"I don't know about that," Fasset responded; "but Johnnie says as soon as it is old enough he will teach it to 'holler'; and the little girl's surprise and joy know no bounds. 'Why, papa,' says she, 'did you *spects* it?'"

But we were soon at my queen-castle, or queen-rearing establishment, and Fasset laughed.

"Not a very large structure, is it?"

"No, it isn't. All I wanted was a place that was warm, and large enough to transfer young larvæ to queen-cups and keep a few tools in. It is just 4×6 feet, and yet roomy enough for a good deal of business. A small sheet-iron stove at one end will raise the temperature to 90° very quickly with a single fire cool mornings in May or June. A shelf at the other end, some twenty inches wide, and high enough to come above my legs when sitting on a stool or in a chair, makes the best kind of bench for transferring larvæ. A window about two feet square, just at my right side, and facing the east, gives me light just where most useful. A few small shelves at the sides above the broad shelf give place for my glasses, tools, 'Doolittle's Scientific Queen-rearing,' etc. A thermometer hanging right above the broad shelf in front of me while I am working shows the temperature at a glance. Two old supers nailed to the side above the stove gives a place for storing queen-cages and cell-protectors. It protects me from robber-bees and gives me a warm convenient place to work; and, as I said, it is a great source of pleasure. From my seat I can reach almost over the whole building, and get any thing I want. I found some old pieces of joists in a rubbish-heap, for sills. Two or three old boards from the barn loft make the floor. Then I had a lot of old dry-goods boxes that I knocked apart and used for siding and roof-boards. The most of the expense came in the door and window, and stove and pipe, which, as I said, cost less than two dollars. Here I can sit in a warm comfortable place, even when cold outside, and with a quill-point change the plebeian life of worker-bees into the estate of queens with all the honors and dangers of royalty."

"About what I need," said Fasset. "Another thing," said he, "I want to ask about. I am away from home a good deal, and I don't have good luck in cutting out queen-cells and putting them in a nursery when only six or seven days old."

"How do you manage under these circumstances?"

"Well, I have to be away from home a good deal, you know, and have anticipated just such troubles; so I made last winter some queen-nurseries of a different pattern from any thing I had ever seen, and was going to give the bee-journals something new; but I see Pridgen, in a late number of the *Review*, has practically the same thing which he slips right over a stick of queen-cells. Beginners at queen rearing by the Doolittle style find it a little difficult to select larvæ of just the right age, and such a cage keeps any queen that hatches too soon from killing the rest. It can be slipped over the cells on the ninth day, and every thing is safe; but you have got to have your cells placed on your stick pretty accurately so they will fit."

"Well, now, that is cur'us and pretty interesting," said Fasset, as I lifted a frame from a hive with eleven large queen-cells and as many queens already hatched in this nursery.

NOTES OF TRAVEL IN EUROPE.

BY J. T. CALVERT.

On leaving home, July 16, I planned to spend an afternoon in Syracuse, N. Y., on my way to Boston to take the boat for Liverpool. I spent a pleasant and profitable time there with our genial friend F. A. Salisbury. I was greatly interested in visiting the works of the Solvay Process Co., an immense institution employing 3500 men. Some four to five thousand horse power in water-tube boilers is required to produce steam for operating the great quantity and variety of machinery and pumps in the works. The output of the works is soda in its various forms.

We sailed from Boston July 18, about 3 P. M., on the steamer New England, of the Dominion Line, bound for Queenstown and Liverpool. We had 1001 passengers aboard, and the crew consists of about 600 more. The length of this vessel (565 feet) laid down nine times makes almost a mile. It is a veritable floating palace.

We had ideal weather for the voyage—so

favorable, indeed, that one of the sailors who has been crossing back and forth for the past 39 years said that he believed, taking all conditions into account, it was the best voyage he has had. We did not encounter any icebergs, rain, or fog; but we were privileged in sighting one or more vessels each day. We passed several schools of whales and many of porpoises. These are fish about five or six feet long with wide-spreading tail, and they leap from the water very often in pairs as though they were racing with each other and with the ship, and were frolicking for our amusement. The salt water of the ocean is a very dark green; and as it is dashed up into spray at the bow by the force of the vessel it changes to a light sea-green or bottle-green, which is beautiful. I noticed the first night a most peculiar phenomenon to which my attention had never been directed. As I looked down into the water by the side of the ship I noticed a great many little lights in the water, varying in size and brilliancy and duration. They reminded me of fireflies, or, as we sometimes call them, "lightning-bugs." They are phosphorescent animal life in the water of the mighty deep, emitting a light all their own, which, however, they doubtless store up from the sun's rays, as the sun is the source of all heat and light and life physical. They were making their light shine just as we who have absorbed the light of life from the Son of Righteousness should make our light to shine amid the darkness of this world of sin.

We touched the dock at Liverpool on Thursday, the 26th, at 5 P. M. The next hour was consumed in removing baggage, and there must have been at least 200 men employed at this on vessel and on shore. At six the passengers began to land, and at seven we had passed our baggage through the customs and were aboard the special train which was to carry us to London. The trip required four hours' time, running at the rate of at least fifty miles an hour, and not more than five stops on the way. It was not dark till nine o'clock, so we had a good opportunity to see the country through which we passed. I was struck with the extreme neatness of every thing. The streets and roads were as clean as though they had been swept. The embankments were covered with green sod. The buildings were almost universally of brick. I have not yet seen a wooden building. Many, of course, are of stone. Neatly trimmed hedgerows divide the fields and farms, and line the roads and railways. Occasionally a temporary wooden fence was seen alongside a young hedge. The wheat and other crops were still green. The passenger cars on the railways are divided into compartments across the car from one side to the other, having two seats facing one another, and a door on each side. When once you are in and the train starts, there is no intercommunication between compartments in the train. A train can be emptied very quickly, as not more than twelve people can occupy a section having an exit door at the side opening directly on to the platform. No conductor or other official can pass through the train. Tickets are secured before taking the train at what is called the "booking office," and there are three classes, with little difference in the accommodations, except that in the first or second you can be a little more exclusive. There is quite a difference in the fares. Most people travel third class, and the fares are very low. Tickets are examined or collected at the station when taking or leaving the train. On long-distance trains requiring several hours to make the run, there is intercommunication between cars and compartments; but the cars are totally different from any we see in America. In this country of short distances and more dense population this system is much better than ours, and yet it would not be at all suitable in America, except, perhaps, for suburban trains in the large cities.

There are no crossings at grade. All roadways and even foot paths, as well as other railways, must cross above or below, never on the same level. In the streets of London there are no electric cars, and I have seen no street cars as we have them. The common conveyance is called a bus, with seats on top for fourteen people, and inside for twelve, drawn by two horses. Except in rainy weather most people prefer to ride on top, and you must climb the winding stairs at the rear while the bus is in motion. In fact, they come to a dead stop as little as possible, because it is hard on the horses They can keep it in motion much easier than they can start it. In some places there are what are called tramcars. These are constructed like the buses, but a little larger, and run on steel rails. A two-wheeled rig having the driver perched up in a box behind is called a hansom, and is very common as a private conveyance for one or two persons. Fares on the buses vary from one cent up, according to the distance. There is being put in, but not yet open for traffic, a system of underground electric cars away below all sewers and other underground railways, about thirty to forty feet below the surface, with lifts (or elevators) at each station, and universal fares of 2 pence (equals 4 cents) between all stations.

The population of London is over five and a half millions, and the great mass of the people live in tenement and apartment houses and flats. Even in the suburbs the number of houses standing alone is very small. But a very small number own their own homes as compared with American towns and cities.

I am particularly struck with the marked civility and gentlemanly bearing of the people. You may accost any one on the street, and always receive a courteous and civil answer. They appear not to begrudge the time taken to be civil. Indeed, they will often volunteer just the information needed at the opportune time. In the common exchanges of everyday life the deferential "thank you, sir," is heard on every hand, even between servants and porters. I have not yet heard a word of profanity nor any thing approaching it.

The feeing system is quite universal, and servants expect a fee for every service rendered. No doubt this has its influence in molding their manners, and yet they are none the

less courteous if they do not receive the expected fee. They are often quite ready to remind you of the fee in an adroit way.

DO BEE-KEEPERS' CONVENTIONS PAY?

"Good evening, Mr. Doolittle. I ran in a little while to-night as I had a little spare time, to have a chat with you. Will you attend the National Bee-keepers' Convention at Chicago the last of this month?"

"I shall not. My mother, nearly 85 years old, is apparently just about to pass to the beyond, the better land for all those who have trusted in Christ, as she has done for over threescore years, and my duty is plainly at home."

"Sorry to hear of your mother's low condition. But do you really think that it pays to attend bee-keepers' conventions?"

"That depends very much upon the spirit in which they are conducted."

"What do you mean by that?"

"If they are simply for the purpose of getting a crowd of bee-keepers together, the majority of whom are obliged to listen to the dissatisfaction of a few who wish to discuss the faults of other bee-men, to 'get even' with some one who has got the start of them at some former convention, or for the express purpose of puffing the wares a few have for sale, then such conventions are neither beneficial nor profitable."

"I have heard something about a convention once held in this State that was something along the line you speak of."

"Yes. We have not only had county and State conventions conducted thus, but such things have even touched the national organization also. But of late years there seems to be a spirit of reform in this matter, for which I am very glad."

"But do conventions pay at best?"

"If one convenes wholly for the purpose of discussing subjects connected with the practical part of bee-keeping, each one freely imparting knowledge on any subject to which he can add his mite, so that *all* are willing to give an equivalent for the knowledge gained, then I say bee conventions pay."

"Will you tell me more explicitly about the paying part?"

"There are three prominent points to be kept in mind in attending conventions, if we would make them pay. The one I consider first in importance is this: We should forget all of the cares and duties which have pressed on us during the year, and go to the convention like "a boy let loose from school," to recuperate our health and life, while on the journey to and fro, and by a free and social intercourse outside of convention hours. By this latter we often learn more of value than we do during the hours the convention is in session."

"But I can go over and see Mr. C. and chat with him on bees, and save the expense of attending the convention at some distant place, can I not?"

"Yes; but you can not see A, B, D, and E there, besides a host of others with whose names you are not familiar, many of whom you could not see except at a cost several times that of going to a convention. I fear we do not prize these social privileges highly enough. There are things that pay better than working for honey constantly, that said honey may be turned into money, and the social part of life is one of them."

"Money-getting seems to be the main part of the program in the world at the present time."

"I fear you are too nearly right in this matter. But each of us who sees that the world is going in the wrong direction in this matter of worshiping money should do all we can to bring about a reform along this line, and a bee convention is a good place to start the ball to rolling among bee-keepers."

"But what about the second point?"

"Our second object should be to secure all the information we can, so that we can put it in practice in the apiary, and, if of value, impart that value to others; to a neighbor, through the bee-papers, or at some future convention."

"But I should think you would forget much that was said and done before it came time to put it in practice, especially where the convention was held in the winter."

"This is quite liable to be the case where one depends entirely upon the memory. But where a person makes a sort of reporter of himself, and jots down in a small book the leading thoughts of each speaker, very briefly, he can, after getting home, look the matter over so as to bring the whole fresh to memory. The matter which is considered the more important can now be written out in another book, the same having four or five pages for each month in the year, writing the important matter under the month to which it will apply. So when the month of June arrives, with this book before me I can put in practice what A, B, or C told the convention about the day before Christmas, the year before. Suppose A told us that bees would do better work where the hive was raised an inch from the bottom-board, when the white clover commenced to bloom—better not only as to surplus honey, but better to keep the bees from swarming. This is jotted down for June, for this is the time the white clover blooms. Upon opening our book our eyes fall on this matter, and immediately we put the thing in operation on about one-fourth of our colonies, when the end of the season will give us the results. If the results are in favor of thus raising, we will tell at the next convention just how we did it, and just what and how much benefit there was derived from it."

"But why tell of it? Why not keep it to ourselves as part pay for the expense of attending the convention?"

"For two reasons. If selfishness is the prompting motive, the *first* reason will be that, in the telling, the matter will be the more thoroughly imbedded in our minds through a reflex action, and thus we shall be benefited more and more. Undoubtedly you have heard the old metaphor along this line, which runs:

There was a man, his neighbors thought him mad;
The more he gave away, the more he had.

"It is impossible to impart knowledge to others without being benefited by this reflex action. And the second reason why we should tell of it is that the world may receive the benefit of what we know, so that generations following may be bettered by standing on more advanced ground than where we stood. If a man is so selfish that he keeps all to himself, and dies with all the good things which he found out, the world is not a whit better for his having lived in it."

"Never mind your sermonizing. What of the third point?"

"Thirdly, we wish to examine all the implements, hives, etc., to see if any of them, or parts of the same, will help us in securing our products more easily, with less expense and in better shape, or give us more than we already secure with our own fixtures. In short, bee conventions not only pay in many ways, but also tend toward cementing together those who attend, with a love and good fellowship that is worth more than dollars and cents can buy. But I am obliged to meet an engagement at eight o'clock, so shall have to hitch up my horse and be going."

THE frequent rains over the country are causing good fall flows of honey in various sections, especially in Wisconsin, where there was such a drouth and an almost complete failure of white honey.

SAMPLES of bees are being sent in right along for me to measure their tongues. So far the longest measurement I have obtained is $\frac{20}{100}$. I am not able yet to get any great variation. Some tongues will show up .16, some .15, and some .18.

THE county fairs will soon be held over various portions of the United States; and beekeepers who are in the immediate vicinity of them would do well to fumigate all their colonies with a little tobacco smoke in the morning. It is our plan to give our colonies about two or three whiffs, and then repeat the operation two or three hours afterward. Without this tobacco dosing we are likely to have trouble with the candy-men from the frequent visitation of the bees.

BY the special notice given on page 702, of this issue, our readers will see that we have at last succeeded in getting a $200 red clover queen with bees having extra-long tongues. This queen and her colony have given the most remarkable showing in red clover of any bees since our red-clover stock of over 20 years ago, and which we have been trying to duplicate ever since. We now have it, and, what is more, the queen is a leather-colored one, imported direct from Italy.

PERHAPS the average honey-producer will feel that the long editorial in this issue on queen-rearing will not be of any special interest to him; but I am thoroughly convinced that *every one who keeps bees* should rear a very large per cent of his own queens. If he uses late methods, and goes at it intelligently, his stock of queens will be fresher and better, for I can not help feeling that a journey through the mails often interferes with the longevity and future work of queens.

THE FERRIS WAX-EXTRACTOR.

WE recently had a very pleasant visit from C. G. Ferris, of South Columbia, N. Y., of wax-extractor fame. Mr. Ferris has given the subject of rendering of old combs a very careful and thorough study. After an extended examination into the merits of his machine we have about concluded to catalog it for next season, believing it to be the most efficient of any thing ever devised. True, it has to make use of artificial heat, but I am satisfied that it will pay for itself in the extra wax it will secure, before the season is half over. We hope to present it to our readers very soon, with illustrations of the special features of the machine.

INTRODUCING QUEENS BY THE PASTEBOARD METHOD.

REFERENCE has been made in the *American Bee Journal* editorially, to the new method of introducing that we have been using in our apiary for a year or two back, and which we have recently applied to all the Benton cages that go out from our office. It is well known that the release of the queen from the Benton cage has hitherto been accomplished by the bees eating out the candy through a small hole in one end of the cage; but up till a few months back this hole has been plugged with a small cork. The receiver of the queen was directed to remove said cork when he placed the cage on the hive. It sometimes happened after a long journey that nearly all the candy was consumed, and in such cases the queen would be released before the bees got acquainted with her and kill her. But all this has been changed. A piece of pasteboard with a line of perforations is nailed over the hole, instead of plugging it with a cork. When the cage is received it is laid on the brood-frames after removing the cover, and that is all there is of it. The bees will stick their tongues through the perforations, gnaw the holes larger, and tear away the pasteboard. This takes anywhere from 12 to 18 hours, after

which the candy is eaten out and the queen released, so that the whole thing, from beginning to end, is automatic. All the receiver of any queen has to do is simply to take the cage, remove the cover, and then lay it on top of the brood-frames of the queenless colony; close the hive up, and "let 'er go, Gallagher." You press the button, and the bees do the rest.

This method of introducing is no experiment. We have used it in our own apiary for a year back. Mr. Wardell, our apiarist, came to the conclusion that bees were eating out the candy too quickly, and sometimes releasing the queen before they had had a chance to become acquainted with her. He conceived the idea of nailing a piece of pasteboard over the candy, as a restrainer, which, from his knowledge of bees, he thought they would gnaw away. The scheme worked perfectly. He thought so little of the invention that he did not tell me any thing about it, and I presume he had been using the method for some six months before I happened to blunder on to it —that is, I learned that he had made an improvement in the ordinary method of introducing by the candy plan. He continued using it with the greatest success; but, as he used it, it was in connection with the Miller cage, which used just the same principle as the Benton.

Early this summer we applied the plan to all the Benton cages we sent out, and the results secured have been uniformly good. By the old plan, after the receiver of the queen had removed the cork the candy had been so much eaten by the bees, in some cases, after a long journey, that the bees would sometimes release the queen in from ten to fifteen hours, which is altogether too short a time; but now these same bees spend from twelve to eighteen hours in eating away the pasteboard before they get at the candy, and at the very least calculation it takes very nearly 24 hours before they can release their new queen-mother, and nine times out of ten it will be much longer.

I asked Mr. Wardell what per cent of queens he could introduce safely by this method.

"Why," said he, "I do not lose any at all."

"Would it be safe," I asked, "to say in print, that at least 99 per cent of the queens introduced by that method would be received and accepted by the bees?"

"Why," he replied, "if I were using the Miller cage I think I could guarantee a good deal *better* than 99 per cent."

We have heard of many methods of introducing queens, but I do not think there has been any thing yet devised that is so simple for the beginner and the average person to apply as the candy-pasteboard method. If the Miller cage is used (a flat oblong cage), and the colony has not been queenless for over four or five days, you can almost guarantee absolute introduction. The Root Co. would do so now; but the trouble is, so many colonies to which queens are introduced have been queenless for a week or ten days that the bees get to depending on their cells, and then it is often very difficult to introduce to them a queen by any plan.

THE VARIOUS MODERN METHODS OF QUEEN-REARING COMPARED.

MR. WARDELL, our apiarist, has, as our readers know, been very successful with the Doolittle method of rearing queens—so successful, indeed, that he felt disinclined to try any other. Said he, "Ernest, I get good results by this plan that I am used to, and from your own statement I make a success of it; now do not go and ask me to go and try some other fellow's new-fangled plan, and get me all mixed up." But I insisted that he try the Pridgen, the Atchley, the Alley, and the Jones methods. Having heard the most favorable reports from Dr. Miller about the Pridgen plan I was very anxious Mr. W. should give it a very thorough test, and this he seems to have done very carefully and conscientiously.

The Pridgen plan differs from the Doolittle in that the Pridgen removes the cocoons of larvæ, just hatched, by means of a little stick with a concave bottom that fits tightly into the cocoon. This cocoon on the stick he inserts in his little goblets, or wax cups, twists the stick, loosening cocoon until it adheres to the cup. The plan further differs from the Doolittle in that Pridgen does not make use of royal jelly, but simply depends on the regular food which the larva has in the bottom of the ordinary worker-cell, and which has been removed—cocoon, larva, and all—at one operation, and inserted in a goblet queen-cup.

The Jones plan, which is practically the same as the Alley, makes use of ordinary drone cups, or cells, shaven down, and then grafted, every one or two cells in alternation, with royal larvæ.

The Alley plan is the same, except that he uses worker comb containing eggs, every other cell of which is destroyed, including the egg.

The Atchley method is much the same as the Pridgen, except that the Atchleys remove the cocoons and insert them, or did do so, in cups by means of tweezers.

Mr. Wardell has tried faithfully and carefully all of these methods, and at the present time he is using all of them side by side. The result is, he has drifted somewhat from his first love, the Doolittle plan, and now prefers drone comb, grafting with royal jelly and larvæ every fourth cell. That is to say, he grafts one drone-cell, skips two, which he destroys, then grafts the next one, and so on. He will take an ordinary queen-cell of the right age, when it has the largest amount of royal food, and with the quantity in that cell he will supply 20 ordinary drone-cups with sufficient food to give the cells which he grafts a good start. But before the drone-cells are grafted he enlarges the opening of the cell by means of a blunt stick. These grafted cells of drone comb are then fastened on a stick and inserted in a frame. It is next given to a queenless colony that has previously been fed up for three or four days, and then deprived of all unsealed brood.

COLONIES FOR CELL-BUILDING.

He now prefers queenless colonies, or colonies that are about to supersede their queens, to upper stories having a reigning queen be-

low. He says the upper-story plan is all right during the swarming time, but it is impracticable (although he can use them) after the honey-flow.

Mr. Wardell has recently been using worker-cells in place of drone comb, which sometimes he does not have, and with them he secures uniformly good results. Yet, all things considered, he prefers the drone comb when he can get it.

He wishes it to be distinctly understood that he does not condemn the Pridgen method, which he says is all right, but that he can graft a certain number of drone-cells, or Doolittle cups, with larvæ and royal food, in less time than he can prepare a given number of cells *a la* Pridgen by transferring cocoons; and he also believes that those cells that contain royal food will be more likely to be accepted. While the royal jelly is not absolutely necessary, yet from many experiments he is convinced that it furnishes a larger per cent of accepted cells. He has now charge of our 500 colonies and nuclei, and almost alone he keeps the whole number at work. His experience with us for the last two years must, therefore, be somewhat extended.

HOW TO GET DRONES OUT OF SEASON.

Some little time ago he complained that he was not able to get sufficient drones for fertilizing our queens; that he might give a queenless colony frames of drone comb, and feed them ever so carefully, yet the queens would not lay in drone comb; but he partially solved the problem in this way: He gives a colony a frame containing two-thirds worker comb and about one-third drone near the bottom edges. The queen will start laying in worker-cells, and as her circle enlarges she will gradually work over into the drone-cells. In this way he thinks he "steals a march" on the queens and bees, for he has been able to secure drones from choice stock, and at a season of the year when it is very difficult to get a good supply of choice drones.

Soon after the Philadelphia convention last year I asked Mr. Doolittle how he managed this difficult problem. "I don't manage it very successfully," said he. "At a certain period in the summer there is a time when bees will almost refuse to rear drones." If so good an authority as Doolittle has been floored, perhaps this kink will be worth much to many of our queen-breeders.

263 CELLS FROM ONE COLONY.

A moment ago I spoke of the fact that Mr. Wardell uses, when he can, colonies that are about to supersede their queens. He always keeps such colonies, as he considers them a real acquisition. One such colony has reared for him 263 cells. The bees have been trying to supersede their queen all this time; but before they can possibly get a young mother he takes away their cells and makes them go all over their work again. This colony has actually reared batches of cells, batch after batch, and yet they go on faithfully, building cells without a murmur, in the hope that, in the sweet by and by, they will be able to rear a young queen that will relieve the reigning mother. They have continued this till they have reached the total number of 263 cells, and how much longer they will keep this up remains to be seen. He has other supersedure colonies that he is working in the same way, but none of them have approached anywhere near the record of this one. Possibly the bees have learned that, so long as they rear cells, they are liberally fed. If so, they are worthy of their hire.

Dear friends, I have a particular reason for not putting a text at the head of my talk today. The reason is, I want each and every one of you to put the text that belongs there when you come to recognize it from your own hearts; that is, I expect you to recognize and see the text long before I get to it. The story was told me during that week of camp life away out in the wilderness. During our resting-spells and at mealtimes we were in the habit of having long talks. There was no business on hand to hinder—in fact, there was nothing to prevent. We did not even have to get away from the table to let the women-folks clear up things. Well, during one of these talks Mr. Ed. Grainger said there was a remarkable man in Toronto whom I would like to meet before I went home. Perhaps I shall not get the story just right; but I think I can get it near enough to answer every purpose.

The man he was speaking of is named Gardner. I believe he was not originally a gardener by profession, but he dropped into it by a combination of events. He formerly lived in Philadelphia, and had a position that commanded a good salary. His wife's people, if I am correct, lived in Toronto, and in the course of time it became quite necessary that he and she should move to Toronto on account of his wife's relatives, or something of that sort. He accordingly gave up his good place and looked around Toronto for quite a spell for something to do. Every opening seemed to be supplied. But our friend Gardner knew he could in time work into something where he would get good pay. And now I want you to notice a point right here that does not belong particularly to our talk or sermon. It comes in indirectly.

After Mr. Gardner had satisfied himself there was really no opening for him at any thing like his former pay he decided to take up with the first position that offered, no matter how humble, and trust to his own genius and industry to enable him to let the world see what he was good for. He got a position as janitor at one of the churches, and rented a cottage adjoining said church. Now, there was a nice square piece of ground belonging to the cottage, that ran close up to the church, separated by only a light fence. As his duties as janitor did not occupy all his time he set to

work on this piece of ground, fitted it, graded it, and fined it up as I have often told you about, in the most scientific manner. Then he planted it to beets, carrots, and other garden vegetables, suited to his purpose. He selected some beets with bright-red foliage. Then he selected a variety of carrots with ornamental tops. Who has not noticed the beauty of carrot foliage? I have often remarked that some branches were as handsome as some of our finest greenhouse ferns. He had other vegetables, but I do not remember the names of them. Well, he grouped these vegetable-plants in such a way as to make an ornamental foliage-bed, and it very soon began to attract the attention of passersby. People stopped and looked at that bed of ground in astonishment, and they asked questions about the wonderful new plants. Finally it attracted so much attention the church people begged to have the fence taken down so that it might appear to be a piece of decoration belonging to the church. Greenhouse men, horticulturists, newspaper reporters, and travelers heard of this bed, and went to see it. They stood spellbound with astonishment. Photographs of it were taken, and finally a wealthy man from Philadelphia made Mr. Gardner such an offer to go and decorate his grounds in Philadelphia that he gave up his position as janitor, and went to Philadelphia at a large salary, leaving his family in Toronto. But he finally came back to Toronto, because he preferred smaller pay in order to be with his own people. By this time Grainger Brothers succeeded in securing him. Just now they have an arrangement whereby this Mr. Gardner designs and puts out the finest ornamental and foliage beds in the city of Toronto. I think he stands at the head of all their horticultural artists—not exactly as a landscape gardener, but as a designer of decorative plant-beds. Grainger Brothers furnish the potted plants, geraniums, achyranthus, alternanthera, gymno-carpus, and other plants that are generally used by gardeners, and Gardner plans the beds, puts in the plants, and takes charge of lawns and yards of the finest residences of the city. If I am not mistaken, there is one place in the city where several thousand dollars are expended each year in this kind of ornamentation. The above is by way of introduction of the person I want to tell you about.

Mr. Gardner is a devoted Christian, and from what I know of him (for I have since seen him and talked with him) I can readily imagine that, while he had the humble position of janitor, he asked God to lead him in a way that he could help himself, and do good to his fellow-man. I do not think he was a gardener at the time, but he was, without question, an *observing* man. Well, one of his tasks as landscape decorator was to fix up the lawn of a millionaire. Things went on very pleasantly for a time, and the whole family regarded Mr. Gardner as an acquisition. By and by, however, the millionaire came home one evening intoxicated, as most millionaires are in the habit of doing, so I am told. Oh dear me! can this really be true, that a man who has millions of dollars should so far forget himself and stoop to such folly as deliberately to sell or dethrone his reason and common sense? Well, this rich man met Mr. Gardner in just the mood to find fault and to abuse his best and most faithful friend. He found fault with the work, called Mr. Gardner bad names, and finally commenced cursing and swearing about it. I believe friend Gardner recognized it was not worth while to talk with a drunken man, and for a time made no reply. This seemed to encourage his rich employer to heap on abuse, and to use more foul language; but when it came to blasphemy he spoke up and told him he had never been sworn at by anybody, and said if the work was really so unsatisfactory he would take it out and restore the place to its original condition, without charge. He then would give up his place.

This was so much of a surprise to the man who had been in the habit of riding over everybody it brought him to his senses. He made haste to apologize, and even got his wife and daughter to come out and help him persuade Mr. Gardner to overlook the whole matter, and go on with his work. I hardly need tell you this wealthy man was a skeptic. He had many times bantered his landscape gardener on his faith in God and his religion, and I think he was the one who attacked Mr. Gardner on a line that almost every professing Christian has heard argued more or less. The unbeliever commenced in something after the following fashion:

"Mr. Gardner, let us suppose there are two men, and, if you choose, I will be one of them. I am a man who has been fair and honest with everybody all my life. I have paid my debts; I have kept the laws of our land; I have been guilty of no secret sins or crimes; I am not a hypocrite; the only fault you can find with me is that I can not accept the Bible as the word of God, nor can I accept or believe in the God you Christians talk about. Now, the other man who stands by my side has been a criminal all his life. He has broken every commandment and every law, almost, of our land. He has committed murder, adultery, and let us even suppose that he has even committed an outrage on my own family—violated and trampled under foot every thing most holy—a veritable fiend in human form. This man, with his hands reeking with the blood of his fellow-man, steeped in crime, and hated by every respectable man and woman, goes to heaven, while I go to hell. The excuse for such a state of affairs is that this bad man, before he died, *repented* and *accepted Christ as the Son of God*, which I am not as yet prepared to do."

I confess, friends, a picture something like the above has been presented to me many times by some one who seemed to take pleasure in picking flaws with the gospel of Jesus Christ. I do not think that I ever tried to answer this argument very much. I do not know but I have sometimes admitted I was unable to explain the matter, at least to my full satisfaction. Now, our dear brother of whom I have been telling you has never had a

theological education. In fact, I am not sure he has ever spoken in any meeting nor even in prayer-meeting. I am afraid he is not even a teacher in Sunday-school. He has his peculiarities, like the most of us; but, notwithstanding, he has the spirit of Christ in his heart, and has read his Bible, I am forced to believe, more understandingly than some of the theological students, and may be graduates. He replied very quietly, and, as nearly as I can get it at second hand, something as follows:

"My dear brother, if you will permit me to answer your question by telling another story about two men as you have done, I think I can help clear the matter up—that is, if you are really anxious for light on the subject. As you said, let us bring forward two men. In my case the two men will be brothers. The elder brother was a good man. He had been upright, straight, honest, and industrious all his life. He was a model son. The other turned out to be a shameless scapegrace. The parents, however, kept him under restraint as long as they could. But he finally broke away from all parental authority, scraped up what he could by fair means or foul, persuaded his good old father to give him his share of what would be likely to come to him, that he might get out of their sight and hearing, and go off where he would never be heard of again. This youngster was thoroughly bad. As nearly as we know he was about as bad in every respect as the man you have pictured. Stricken with grief, and with almost broken hearts, the parents handed over the money to this wayward son, and bade him good-by. He went off and plunged into all sorts of debauchery. We do not know exactly what crimes he committed; but it is very fair to infer he broke every law, leaped over every barrier that restrains decent society, went down and down until he was hardly fit to be the companion of the filthy swine it was his duty to care for. His wicked life may have been near its end. He was a wreck in both body and soul. But this man, bad as he was, *repented*. Slowly and painfully he worked his way, and in the course of time he got back to that old home. The poor father had been watching, waiting, and hoping, through all these long years."

I hardly need mention to any of the readers of GLEANINGS the words this poor lost son used when he caught sight of that father. You, my readers, may each place them at the head of my talk for to-day, for an opening text. Now, this elder son, when he came in from the fields, where he had been at his accustomed honest labor, grumbled at the course his father had chosen. My good friends, this story has been before the world ages upon ages; and I do not know that I ever yet heard of a man who said the *father* did wrong in killing the fatted calf, and putting the ring on the hand of the son who was dead and is now alive again—the son who was lost and is found.

The parable of the prodigal son touches the matter in question from another point of view; and I confess that I myself never saw the connection until I heard this little story. Unbelievers, and perhaps others, reject the doctrine of free pardon and forgiveness of sin because they do not believe penitence is genuine. All such should consider that the great God himself has to be judge in such matters. Surely *he* knows whether the penitence is honest and sincere or not. I once called to see a man who was near death, who had been all his life intemperate and profane. He was in great agony of mind. He kept insisting that it would be a shame and a miserable farce for him at that late hour to talk about repentance. I turned to John 3:16 and read the familiar words. He became so excited and disturbed that he raised up in bed, and with tears and sobs choking his utterance he said, "Mr. Root, I have taken God's name in vain almost every day of my life. I have never tried to be any better. It is too late, too late. The idea is absurd that I can at this late hour become a Christian and have my sins forgiven."

I read different passages in the Bible; but, may God forgive me, it did not even occur to me to read that little story of the prodigal son. Finally he would calm himself a little, and ask me to read the promises over. He asked me to read them more slowly. I explained them to him again and again. I told him of the thief on the cross. Then he would brighten up at times, but Satan would then get hold of him again, and he would declare that a just and righteous God *could not* consistently forget and forgive, and wipe away his sins. I was obliged to leave him. Next day I was told he was dead.

When I first studied geometry I was amused at the way in which they discussed problems by accepting an absurdity for the time being. I think my book read, "Let us suppose for the time being that a straight line is not the shortest distance between two points;" and with this basis they went on with the demonstration. Let us now suppose, for instance, that the Bible is not true, especially in regard to the prodigal son. Let us suppose that there is no pardon or help for the sinner who has been exceedingly bad. In that case, every last man and woman would give up after going a certain length. The down-hill road of vice would be easy, as it is now, but the up-hill road back to virtue would be cut off. The gospel of Jesus Christ would be virtually ruled out. There would be no such thing as exhorting sinful humanity to repent, and "sin no more." And yet how many there are who say sometimes, with a lofty toss of the head, "None of that kind of religion for me, if you please. I ask for simple justice." And some may say the elder son had it about right; and they may say with him, "What encouragement is held out to live honest and virtuous lives?" Yes, I have heard something like this: "You preachers would almost make out that it is better for a boy to sow his wild oats—get drunk and swear, and may be get into prison, so he can pose as a reformer, and be lionized." God forbid. While we do sometimes make a great adoo over a penitent thief or a reformed man, all the world recognizes that it is better to lead a clean, pure life from the start. All sin leaves its scars, and a cer-

tain amount of disgrace attaches to any one who has been recreant to the trust laid on him by his fellow-men. The old father replied to the elder son, "Son, thou art ever with me, and all that I have is thine." When a man *prides* himself on his upright life—when he *boasts* of his clean and faultless record in the past—he is guilty of another sin—self-righteousness. Of course, a good record is not to be despised; but we should give God the praise. It is our duty as followers of the dear Savior of mankind to rejoice at the sight of a clean pure life, and there is no inconsistency at the same time in rejoicing over every sinner who repents and comes back with the thought in his heart, even though he does not put it in words, "Father, I have sinned against heaven and before thee. I am no more worthy to be called thy son. Make me as one of thy hired servants."

CATCHING BLACK BASS.

I have not done any fishing with hook and line, or any other way, for that matter, scarcely, since I was a boy. I believe that in boyhood, however, I used to be regarded as quite an expert. Well, one day we three made a visit to the lower rapids, where we had never been before, and we scattered about a little, each one selecting a place for himself. I remembered that, years ago, I used to have the best success—that is, in the little streams around my home—by going out alone by myself, slipping up very quietly to some deep pool and then dropping my hook near some overhanging rock, or where there was a sort of cavern in the water where the fish could get out of sight, and where they would be shaded from the heat of the summer sun. Well, I found such a place in the rapids, or at least there was a big rock where I had reason to believe there was a cavity under it. I dropped down my well-baited hook just over the edge of the rock. Almost instantly I pulled out a good-sized bass. He made such a determined effort, however, to get back into the water, that I had quite a time in securing him and fixing a place for him so he could not flop back into the stream. Another trouble, my standing-place was on the rocks, partly submerged, so if a fish dropped from the hook he was sure to get away; and, in fact, I lost two or three nice fellows before my companions came around. I did not really know what *they* were doing In fact, I was too busy pulling out bass that weighed two pounds apiece to notice or think of any thing.

I had read somewhere that a humane way of taking fish was to kill them by striking them a smart blow between the eyes, which would cause them to die instantly. Well, I adopted this plan to keep my fish from flopping back into the water. After about half an hour the rest came around to see what I was at that kept me so still. Just as Ed looked around the corner I pulled out a bass more than twice as large as the best I had caught. He made my new pole spring so I was afraid it would break; and I was so fearful he would get away from me by some hook or crook that I fairly trembled as I lifted him out of the water on perhaps a yard or more of line. I had got him up safely away from the shore, but he finally made one great bound up in the air, and came down the length of the line with a sharp snap. The line did not break, for it was made of Canadian seagrass; but the hook tore out of his mouth. I dropped my pole, and did my best to hold on to his slippery sides; but after a big tussle he came out ahead, and I almost felt like shedding tears. Finally one of my companions called out, "Why, look here, young man! Aren't you getting pretty near the limit of the law? No one is permitted anywhere in these waters to catch in any one day more than a certain number of pounds of black bass."

I was pretty nearly up to the limit, without any question; besides, we had about as many fish as we could use before they would spoil. Five or six miles below these rapids there is still another one where a great company was preparing to utilize the power to be carried to the town of Orillia, about 20 miles distant. For days past we had been listening to the workmen blasting rocks; but it was toward the close of the day, and Saturday night, and on the morrow I was to start back home, so I reluctantly gave up the trip. Sunday morning I put in a plea for going to church; but the nearest church was about ten miles away. It was, however, close to the postoffice, and all hands decided we would have to go for our mail on Monday if we did not on Sunday. We were told that services commenced at ten o'clock, and I was very vehement that we get to church on time. Well, we did get there on time, and more too, because they have Sunday-school before preaching; but it took some pretty faithful paddling, as the wind was against us. When we reached the church I was quite fatigued. I had not had my morning nap either. Now, this little church out in the wilderness had only small windows away up almost over our heads, and not very many of them either. The transition from God's free sky, where I had been living for a week, to this little church full of people, was too much for me. The sermon was one of exceeding interest, right in line with one of my talks in a recent Home Paper. But in spite of all I could do I was soon nodding. My good friend G. at my side very quietly nudged me with his elbow, and I very quietly thanked him, making huge resolves I would not be so discourteous to the minister again; but it was not a bit of use, and finally Ed thought he would let me have my sleep out, thinking I would probably wake up and enjoy the sermon. But the close air was too much for me. I slept during almost all the discourse. Ed informed me later that the minister spoke about the disciples going to sleep when they should have been watching with the Master.

He reflected on them pretty severely, and looked right at me. I do not know but my companion said this just to worry me; and how they did banter me after service! Think of my great zeal to get up early, get the canoe started, and then urge expedition until everybody was tired out, and finally show my consistency by sleeping during the entire sermon, shocking the good minister, and perhaps the congregation, and not hearing a word of the discourse! Tommy, however, came to my rescue. He declared that my heart was all right, even if appearances outwardly did not so indicate it; and he said something to the effect that it is far more important that the heart be right than to have the outward appearances up to the highest standard, with a bad heart inside. This may all be true; but still I think if we take a little more pains we may have both—a pure heart inside and proper decorum, at least during religious services. If Mrs. Root had been there she would have given me a fan or some substitute; but somehow I did not think of a fan; and I do not know whether a fan would have been sufficient under the circumstances.

Now, I want to draw a moral right here: Whenever you are building a meeting-house, make provision for abundant ventilation. Down in Florida they have churches that can be thrown open like the open cars in our cities. But why not have more open-air meetings? Of course, there is difficulty in providing seats; but let the people carry shawls or blankets, and sit on the ground. I believe most of the Savior's sermons were in the open air. When we are out on an outing, if at no other time, why can't we have Sunday-schools and preaching outdoors?

After church, I confess it was with a sad feeling that I bade my two companions goodby and saw them start off in the boat alone. I watched them far out on Sparrow Lake until they became a mere speck. Ed had put his cornet under the seat, and just as I was almost ready to shed tears the familiar strains of music came floating off to us across the lake. "May God bless the boys in their outing!" was my prayer. I supposed I was a stranger in a strange land; but one of the boys at the boarding-house informed me he had read the A B C book, and that he had kept bees quite successfully for several years; so I was pretty soon at home again. The next morning I found another bee-keeper in the neighborhood who still has quite a pretty little apiary; but his mind is pretty well taken up just now with something else. He has recently started the finest hotel on Sparrow Lake. What do you think he calls it? "Uneeda Rest." It seems to me that is very appropriate. The shore is all clean white sand around the hotel. The water is as clear as any spring water. Men, women, and children are almost constantly playing in the clean white sand and clear water. It is Mr. J. W. Clipsham, Sparrow Lake, Ontario, who has the hotel and the bees.

Perhaps I should add, in closing, that I attended church again in the evening, and did not go to sleep. I had had a good big nap, stretched out on my blanket on the shore of Sparrow Lake, where I could draw in the breezes from over the water to my heart's content while I slept. After the evening service I apologized to the good pastor for my bad behavior in the morning.

To reach the boarding-house I was obliged to go two miles around the road or a mile and a half through the woods after dark. I went through the woods, and enjoyed it. On the way home I passed somebody in the darkness. We discussed the sermon; and when I found he was not a member of that little church I had quite a talk with him, and he gave me his hand in parting, and almost promised he would tell the pastor of the church what he had confessed to me alone in the darkness of the night; that he was pretty well convinced that he ought to be with that little band of Christian workers, right in the harness, and helping pull, away out there in the wilderness. I did not even learn the name of the man, and in the darkness I did not even see his face; but I went to bed with the feeling that the Sabbath was not entirely lost, even if I did, by my blundering, sleep during the morning sermon.

GREENHOUSE-BEDS; HOW SHALL THEY BE MADE?

While we were out in the wilderness Mr. Grainger mentioned a great range of greenhouses—in fact, one of the largest in the world, at Brampton, about 20 miles west of Toronto, and he said I must take a look at the great institution before I went home. I found the establishment as he said, covering with glass between three and four acres, and this with solid greenhouses, not plant-beds, as some of our florists are in the habit of counting their area. Mr. Henry Dale, the proprietor, died July 15; but so well were his plans laid for the new buildings, that the work has gone on almost uninterruptedly. He commenced in 1881, and he himself collected the material before his death for six new houses. Two of them are 840 feet long each—the longest greenhouses in the world at the present time, if I am correct.

Now, you would naturally suppose that one who did business on such a scale as this would leave no stone unturned to get at the very best methods. He purchased his glass in Ireland, his woodwork somewhere else, his piping at still another place; nails, putty, and every thing else, in a like manner. He tried to have the best the world produces in the way of materials, and then he aimed to take advantage of all new inventions and discoveries in the way of construction. He has tried two houses with the short slope to the south, such as was described by friend Slack a few months ago; but for his purpose—growing flowers, mostly roses—he did not think they offered sufficient

advantage to be adopted on a large scale. His new houses are double span, running east and west. The glass is all butted. His men told me he would not have a lapped glass on the premises; and I was a good deal pleased to find he indorsed my ideas on the subject.

The different houses are not separated. They cover the ground entirely. The gutter between the different roofs is supported by an inverted U, the path being lengthwise under the gutter. This inverted U is made of gas-pipe, and conveys the drip under the floor out of the way.

What I wish to speak of particularly just now is the arrangement of the beds. The Dale people have decided on having the beds right right down on the ground—that is, raised only a little above the path where you walk, as I shall explain. Mr. Dale, like myself and many others, said some time ago that he wanted his beds made of something that would not rot out and fall to pieces in two or three years—no more wooden structures for holding the dirt for growing plants. Well, he decided in this way: Have your paths graded off level, just as flat as the floor of a room; then make your beds by laying three courses of bricks so as to make a wall clear around the outside of the bed, 8 inches wide and 3 bricks high. Now fill this bed with sand or some similar material, clear up level with the top of the bricks. Stroke it off with a stick so as to be as flat as a table. On this table lay tiles close to each other, crosswise of the bed. Let the ends of the tiles stick over the ends of the bricks into the paths an inch or two. The tiles in the middle of the bed lie loosely on the sand. The outside row — those that lie across the brick wall — are laid in cement; and on top of these tiles, right over the brick wall underneath them, a second row of bricks is stood up edgewise. These bricks are set very firmly and securely in good cement, and that is all there is to the bed. The bricks used seemed to me to be rather larger than common ones. They are very accurately made—hard and true and smooth. Now cover the tiles with your potting-soil clear up to the top edge of the bricks, and your bed is finished. The soil reaches from down between the tiles to the top of the bricks. There is, perhaps, four or five inches of dirt for growing roses or other stuff. I presume the roots will grow to some extent down between the tiles. Any size of tiles will do. The ones I describe are about 3 inches in diameter. These tiles insure perfect drainage.

The Dale people have tried sub-irrigation, but they do not like it for their work. One of the attendants said that, for rose-growing, one plant may need three or four times as much water as another. The only way to give each one enough, and none of them too much, is to water by hand with a hose. When I saw the men making the beds it occurred to me a single row of brick, even if set in the best cement, would get struck with something and knocked out of place; but when I got along a little further I saw that the heating-pipes, two in number, were around the beds the whole length of these buildings, right along by the side of this single tier of bricks. The upper heating-pipe is a little higher than the bricks, so as to be a protection. These pipes are supported about every four or five feet by means of suitable cast-iron brackets set in the cement and bricks when the bed is made. The two rows of pipe are, I should judge, 1½-inch pipe. The houses are all warmed by steam. The buildings are rather low, the gutter being just high enough to permit a man of average height to pass along the path unber the U's. There is another similar path under the ridge-pole of each house. Here you are with a bed that will never rot out, and I think the drainage will never become clogged. When the one who does the watering sees the water running out of the tiles into the path, he knows he has put on enough for the time being.

They have tried overhead heating, but have decided, at least for the roses, they want only the two pipes I have described.

I said the floor of the greenhouses was level. To secure a proper fall for the drip of the steam-pipes, and also for the gutters, I believe there is a little fall during the whole 840 feet. Having these houses so close together, with the roofs rather flat, produces some shading in winter, but I believe they think it is not enough to do any material injury. The frame of the greenhouses is all iron. The supports that go into the ground are all iron, so there is nothing to rot out. The sash-bars are of wood. There are no walls except clear to the outside, surrounding the whole structure, and these walls are of brick if I am correct. The ventilators run the whole length of these long buildings, and they are operated automatically by thermostats at regular intervals. The thermostat communicates with a piece of mechanism so that the water pressure does the work of moving the ventilators, and they have this arrangement so it works very satisfactorily. The ventilation (or temperature) of the whole range of houses stays just where they want it, without any manipulation. They find automatic ventilation all right, but not so with automatic watering. Brains and water must *both* be used in caring for the plants. The long beds of handsome roses, as healthy as roses can be, was ample proof of the wisdom of the management and construction.

In order to insure perfect drainage, so the beds should never by any accident become flooded, there is an underground passage large enough to work in below the paths through the houses. Through this passage the drip-water from the steam-pipes is carried, and they will always be accessible for repairs or changes. Three immense steam-boilers warm the whole plant. It might be economy in many ways to scatter the sources of heat; but they purchase their coal by the train-load, and an automatic carrier delivers it into a great bin in front of the boilers; and, if I am correct, an automatic feeder carries it into the furnace; so there are obvious reasons for having the heating-apparatus all at one point, and this point is below the general level of all the houses. The grounds outside for the accommodation of plants that do best in the open air are in full accordance with this great glass structure.

I shall be glad to answer questions in regard to any point omitted in my description, and I think it would pay in dollars and cents, many times over, to any one who is building expensive glass structures, to visit the Dale establishment.

ELECTRIC BELTS, ELECTROPOISE, "ABSENT TREATMENT," ETC.

In the *Practical Farmer* of Aug. 15, friend T. B. Terry takes your humble servant to task as follows:

My good friend A. I. Root has been particularly down on the above ways of treating the ills that people have. In regard to a certain kind of electric belt, for example, if I remember correctly he told us in GLEANINGS that the best scientific authorities said they could not by any possibility do any good*, and then they were sold at an exorbitant price, many times what it cost to make one. Thus the poor sick man who got one was both humbugged and swindled. But now really, good friends, there must be another side to this question. To illustrate: At the very time when friend Root was condemning this belt in the strongest terms, the writer happened in the home of a man and his wife in a distant State. They were readers of GLEANINGS, and thus knew me and invited me to their home when I was attending an institute in their town. They were people of more than ordinary intelligence, and some 50 years old. They informed me that our mutual friend Root was all wrong; that the husband had been a great sufferer for years until he used one of these belts; that he was then well and all right. They showed me the belt, and were very enthusiastic in their praise of it. Do you think I said one word against the belt? Do you think I told them there was no electricity about it, and that they paid ten times more than they should? Not much, and I'll tell you why. I believe in accepting good from whatever source it comes. Now, what cured this man (for he was cured beyond a doubt)? His faith in that belt. The mind has a wonderful power over the body, probably many times more power than most people think for. And now, truly, don't you think one would have more faith in a belt if he paid $25.00 for it than he would if it cost only $2.00? Paying a large price impresses the mind of the buyer with its concentrated and marvelous power! Now, I am not upholding any humbug or swind'e; but don't you see there is another side to the matter?

Mr. Terry and I can agree very well right here unless he *recommends* this method of curing people. These rascals have often urged that, if they did not charge a big price, the patient would have no faith and would not get well. Very likely they, and Mr. Terry too, are about right; but how about the man who pays $2.00 for an article and sells it for $25.00? If he is all right and *doing good*, why should not *all of us* go into the business? and, in fact, a great lot of people *are* trying to get into it all the while, especially when they see the palatial residences of such men as Francis Truth, and Weltmer, of Nevada, Mo., and others. Electropoise, however, goes away beyond this. They charge $25.00 for a thing that could be made for 25 cts., and they perform wonderful cures, just such as friend Terry describes; therefore A. I. Root is wrong. He should not object to a thing that is relieving suffering and helping humanity. Better *not* tell the poor man there is no electricity about the trap, even if you recognize it at once. But, hold on a bit. What has become of Electropoise that a host of people defended with such vehemence only a few months ago? So far as I can learn, the thing is not now advertised in any periodical; and I venture to say that the people who claim to have been cured of a long list of diseases by the senseless trap have now laid it aside and are *trying* to forget it. What is the *matter* with it now?

But here is something else from Mr. Terry:

This brings to mind an amusing instance of being too smart in looking out for humbugs. Some fifteen years ago a man came along selling tin pails. In the bottom of each one, two strips of zinc in the form of a cross were soldered. He informed me that water could stand in one of those pails for years, and the bottom would not rust, and he laid it all to electricity, and made a very learned address on the subject. I promptly told him to go right along—that he couldn't humbug me that way. With pity for my ignorance and sorrow for his pocketbook he departed. About that time our tinner did a large job for us; and when I gave him a check he felt a little liberal, and, knowing that I did not smoke, he gave me one of these pails with a zinc cross in the bottom, instead of a cigar. I laughed, but took it. Now, we always have a tin pail standing under our pump-spout in the kitchen. We used tin because it was light, but the best pail I could get would rust out in a year or two. The new pail was put in use at once; and, friends, although it is a little tough to tell such a joke on one's self, that pail is still in use, and good yet after fifteen years.

This zinc-bottom tin pail is another thing entirely. Pieces of zinc have been soldered in the bottom of watering-pots for years past to prevent rusting. I first saw it in the *Scientific American* years ago, and it has been a long time in use. The zinc and the tin, with the water in the pail, make a weak battery, and as a rule the zinc will all be rusted out before the tin rusts very much. About ten years ago we sold such pails by the hundred. They were extensively advertised. We had one for two or three years under our kitchen pump. I have just asked Mrs. Root about it, and she says that, while it helped the matter of rusting, she would not put it as strongly as friend Terry. We prefer now a very light pail made of paper or some such material. It is varnished or enameled so that it is easier cleaned than any metal pail, and is, I think, lighter. Although the pails Mr. Terry describes were sold generally by hardware men and tinners ten years ago, there does not seem to be the demand for them now that there was when they were first introduced.

Permit me to copy a little more of what Mr. Terry has to say about absent treatment:

We hear a great deal nowadays about "absent treatment." That is, a man in a distant place proposes to cure you, without giving any medicine, of any disease, no matter if you have been given up by the doctors. The writer will have to say that he has investigated cases where this seems to have been done. And it is not particularly hard to believe and understand it. If one man's implicit faith in a belt he is wearing causes his cure, why will not as strong a faith in what a man a thousand miles away says he can do have a like result? There are rascals, of course, who carry on this absent treatment; but after all there is a great principle of truth back of it which the world is getting some little hold of. Patent medicines owe their success largely to the faith people have in them. They are advertised in strong language. You are told that they are sure cures, and any amount of wonderful testimonials are given.

I heartily agree with friend Terry that a great principle of truth is back of all these things; and I do believe that we are on the verge of a great reformation in this matter of curing disease; but I do *not* believe tremendous lies (I think this is what Mr. T. means when he says "strong language") and whole-

*I said they could not do any good unless it came through the *imagination*.

sale robbery (taking $25.00 for a thing that could be sold for 25 cents, or *one hundred times its real value*) are going to be the fashion. Would Mr. Terry wish to go into a business of this kind, even though he relieved suffering? Would he employ a physican who cured people after that fashion? God forbid! When I can not be cured without telling me great lies to accomplish the cure, I think I prefer to *remain* sick.

Terry's head seems to be pretty level, after all, for he says, in winding up:

We sometimes smile at the ignorance and superstition of the colored people of the South. Will you please tell me how much more wise are the intelligent white people of this country, who swallow train loads of patent medicines, than the poor negro who carries in his right trousers' leg pocket the left hind foot of a rabbit killed in the dark of the moon, as a remedy for rheumatism?

Very good; but, dear friend Terry, are you, a "teacher in Israel," at least in farmers' institutes throughout the different States, going to keep *still* and let this folly and superstition go on? Are you still going to keep quiet, and utter no protest just as you did in the case of the electric belt?

I am well aware we are often told, "Where ignorance is bliss, 'tis folly to be wise;" but the bliss that comes from ignorance does not last very long. He who is cured of all his ills by the use of Electropoise finds it soon ceases to produce any effect. Then he must have "absent treatment," or whatever comes next after this is exploded; and, once more, what shall our teachers do amid this complexity of fraud and humbug?

A $200 RED-CLOVER QUEEN AT LAST!

We finally have her, and she seems to be fully equal to our old red-clover queen of years ago. The colony of this queen has given one of the most remarkable showings on red clover of any bees we have ever had, notwithstanding the stock has been robbed repeatedly of young larvæ for queen-rearing. The queen in question is an imported one, and, therefore, of the genuine pure leather-colored Italian stock. We have been sending out daughters from her all the season, but we had not discovered her value until the clover season, second growth, came on, and then her colony so far outdistanced all the other 450 that she attracted attention at once. We have concluded we can not sell her daughters untested any more for 75 cents; but when taken with GLEANINGS we will sell them for $1.00; that is, to say we will send GLEANINGS one year, and an untested red-clover queen from this $200 mother, for $2.00; a tested queen of this same stock, and GLEANINGS one year, for $4.00; or a select tested and GLEANINGS for one year, $6.00. These queens will be sold only in connection with GLEANINGS. If you are already a subscriber your subscription can be advanced one year, or you can send the journal one year to some friend.

We expect a great demand for these queens, and therefore can only guarantee that the orders will be filled in rotation and sent as fast as they are ready to send out. Those who send orders immediately will stand the best show of getting stock at once. We can not guarantee to supply, this season, select tested stock, as we may not have it, as such queens will necessarily be limited, but we *think* we can furnish all that will be called for.

It must be understood that these queens are not golden yellow, neither are their bees of the five-banded stock. They are simply leather-colored Italians whose mother came direct from Italy. Those who desire queens of this stock had better get them this season, as the queen may die this winter. At the present time we are setting aside some of her choice tested queens for next season, to test for our own use.

But we have sold hundreds of these same queens, not knowing their value until now, at the regular prices, and there must be hundreds of our subscribers and patrons who have some of this choice stock. You will be able to recognize it by the great gentleness, the leather color, and by the fact that it shows a special aptitude for red clover; and if you measure the tongues of the bees, if they are like that of our breeder you will find that they are extra long. If you have one of these choice queens you had better take particular care of her, as she may be worth much to you in the breeding of choice queens for your own apiary.

Special Notices by A. I. Root.

NO MORE SAGE SEED WANTED.

Thanks to our California friends, we have received all the sage seed, both black and white, we shall need for the present. In fact, some packages have been sent us without a word as to who they were from, or telling us how we shall pay for it.

DWARF ESSEX RAPE.

This is also just the season for the above. We have a nice stock of seed at 10 cts. per lb.; 50 lbs. or more, 9 cts.; 100 lbs. or more, 8 cts. per lb. We can mail a leaflet in regard to its cultivation, on application.

WHITE AND YELLOW MULTIPLIER ONIONS.

These never run up to seed, but simply divide and multiply. The yellow ones are sometimes called potato onions. Quart, 20 cts.; peck, $1.00; bushel, $3.50. These are for the small ones; large size, one-half the above prices. Either kind may be planted in the fall.

TOP OR ACORN ONION-SETS.

These are also now ready to harvest; but I believe that, as a rule, they are not set out till spring. One reason for purchasing now is that they are almost always sold out before spring, and we have grown only a limited quantity this season. Prices, same as for the multiplier sets.

Add 10 cts. per quart for postage on all onion-sets when wanted by mail.

WINTER OR EGYPTIAN ONION-SETS.

This is the best season of the year to put them out, in my opinion. Price, quart, 10 cts.; 50 cts. a peck; bushel, $1.50. We have both large-sized and small-sized sets. The small ones will, of course, give you a greater number of onions; but the large ones will give you stronger plants. This kind of onion never fails to grow, is never winter-killed, so far as I can learn, and it will hold its own year after year, almost in spite of weeds or any thing else.

GRAND RAPIDS LETTUCE.

If you are going to grow lettuce under glass, you had better sow some seed in the open air right away now. By the time you get strong plants, well rooted and hardened off by cool fall weather, it will be just the right time to plant out in beds under sash or in the greenhouse. A very little seed will make you a great lot of plants, and there is probably plenty of ground vacant now where it is richest and best. In many places there is a good trade for nice lettuce Thanksgiving time; and between Christmas and New Year's it will sell almost anywhere, when people once get a taste of some grown as it should be. We have a big lot of seed that has been fully tested. An ounce is only 5 cts., and 1 lb. only 50 cts. If wanted by mail, add 1 ct. for the ounce, or 8 cts. for 1 lb.

POTTED STRAWBERRY-PLANTS.

So far as I can learn we are the only strawberry-growers in the world who send out potted strawberry-plants *by mail postpaid*. We do it, as I have frequently explained, by potting them in jadoo fiber. We expect the plants to reach you just as bright and fresh as they are when first taken out of the garden; and if put out in good soil they should take right hold and

grow at once, put out new runners, and give you a nice crop of beautiful fruit next season. Of course, the ground must be rich, and you must keep the weeds away. The sooner you get them, the more chance they will have to grow this fall.

They are now ready to send out at 3 cts. each, or 25 cts. for 10, by express; or 5 cts. each, 40 cts. for 10, by mail. The following is our list of standard varieties:

OLD STANDARD VARIETIES.	NEWER VARIETIES.
Jessie.	Rio.
Haverland (Imp.).	Marshall.
Bubach (Imp.).	Wm. Belt.
Warfield (Imp.).	Margaret.
Sharpless.	Nick Ohmer.
Parker Earle.	Brandywine.

The new berry called New York will be double the above prices. This is much like the Sharpless, fully as sweet, and of rather better shape. The blossom is perfect. No layer plants at present except *Earliest*. Price of these, *postpaid*, 15 c. for 10; 85 cts. per 100.

CONVENTION NOTICE.

The second annual picnic of the Cayuga and Seneca County Bee-keepers' Societies will be held at Atwaters' Glen, on Cayuga Lake, Wednesday, Sept. 5, 1900. An interesting program has been prepared, and a good time is expected. J. W. PIERSON, Sec.